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Maine Comprehensive Power Plan

Maine State Planning Office

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Maine State Planning Office

MAINE COMPREHENSIVE HYDROPOWER PLAN

Executive Department
Maine State Planning Office

July 1992

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Richard H. Silkman, Director
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STATE OF MAINE
EXECUTIVE DEPARTMENT
STATE PLANNING OFFICE

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July 9, 1992

Ten years ago the Maine Office of Energy Resources submitted its, Comprehensive Hydropower Plan, to the Federal Energy Regulatory Commission (FERC) as a proposed comprehensive plan under section 10(a) of the Federal Power Act. The State of Maine supplemented the 1982 comprehensive hydro plan with its three volume, State of Maine Comprehensive Rivers Management Plan, which was submitted to FERC in Spring of 1987 as fulfillment of the State's obligation to comprehensive hydropower planning. This compendium of documents includes the 1982 Maine Comprehensive Hydropower Plan, the Maine Rivers Study and the subsequent laws, orders and plans affecting hydropower planning and permitting that transpired between 1983 and 1987. In November of 1988, FERC recognized Maine's plan as an official comprehensive plan, which meets the requirements for comprehensive hydro planning.

Many changes have taken place which make the original 1982 Comprehensive Hydropower Plan out of date. The effect of the Public Utilities Regulatory Policy Act (PURPA) on hydro growth in Maine was very significant. Available PURPA benefits and a period of rapid growth in Maine stimulated an unprecedented increase in small privately-owned domestic energy plants during the 1980's. But the increase in hydropower development that resulted was quieted by the onset of low oil prices and correspondingly low avoided-cost rates. In addition changes in the Federal Power Act made many previously attractive hydropower ventures no longer economically feasible. A healthy and booming 1980's economy, which spawned massive infrastructure growth in Maine, cooled causing a need to look critically at the projected energy future of Maine. The passing of a decade characterized by fluctuating economic factors and energy supply options and demands warrants a fresh look at many of the hydropower issues that were addressed by the 1982 plan.

This plan provides current data on hydro projects in Maine, summarizes the effects of the past decade on Maine hydro and comments on the prospects for future hydro development. By providing this 1992 update of the 1982 Comprehensive Hydropower Plan, we continue the process of reevaluation of the potential for prudent hydro growth in Maine.

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THE ROLE OF HYDROPOWER IN MAINE'S DEVELOPMENT

Maine has a long history of harnessing water for power due to its abundant river systems and their suitability for the development of hydropower. The shape of Maine's river systems, the location of our historic factories and mills, and today, our major cities are the result of over 200 years of development. During these centuries of development, Maine's rivers have provided beauty and sanctuary but also the jobs from which thousands of Maine families have earned their livelihoods in industries as diverse as timber, ice, food, shipping and power. They have supplied the raw materials and transport upon which industry has thrived.

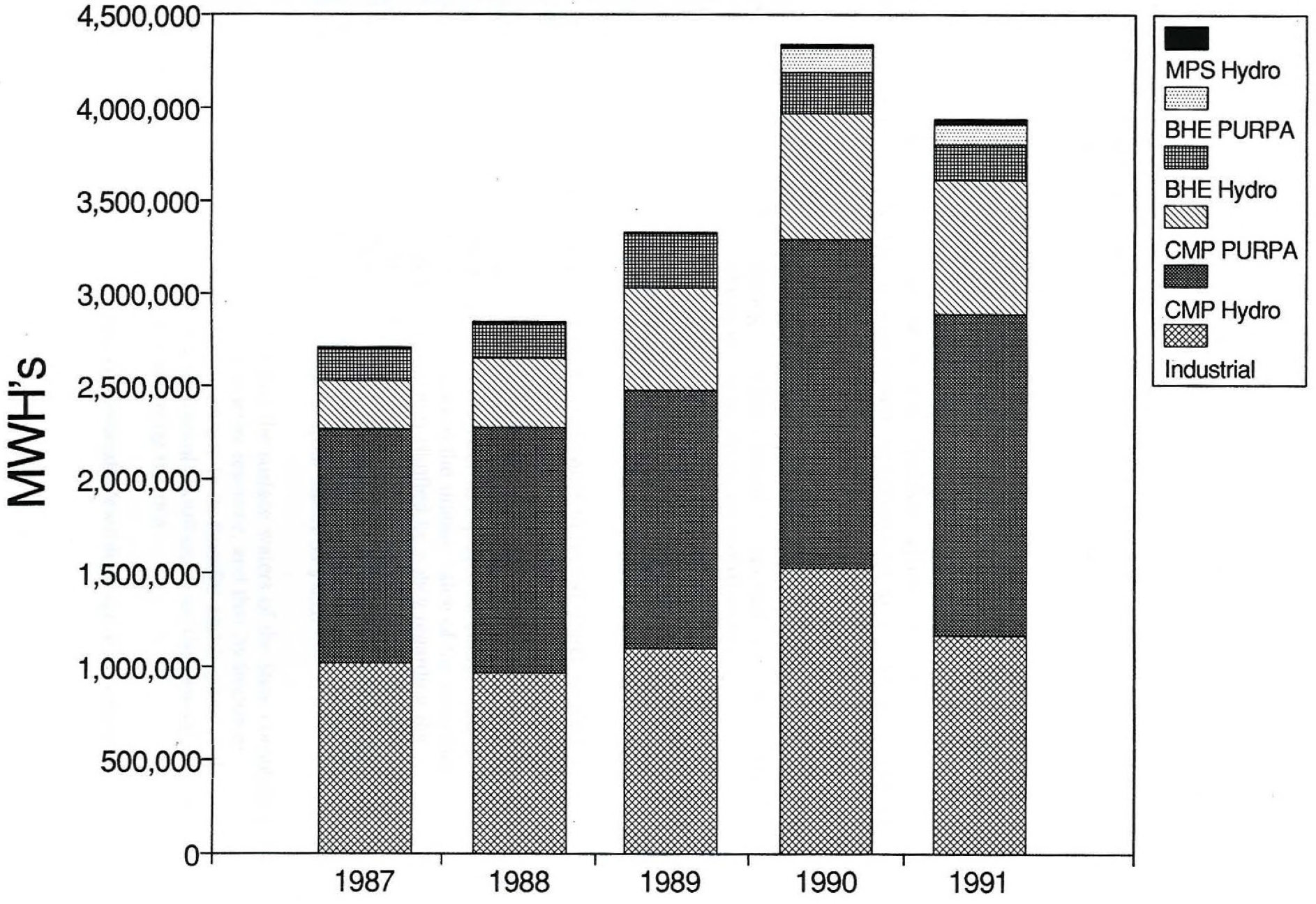
THE CURRENT CONTRIBUTION OF HYDROPOWER IN MAINE AND NEW ENGLAND

Today there are 122 hydroelectric generating dams in Maine which include utility, industrial and small hydro generating dams. Seventy-six of these projects are licensed with FERC and have a combined installed generating capacity of 691 megawatts (MW). Another 31 small scale projects representing 9.5 MW are approved within the state but are exempt from the licensing provisions of federal law. In addition, 15 unlicensed generating dams, representing 31 MW of installed capacity, and 21 unlicensed storage dams in Maine have been evaluated by FERC to determine the need for licensing. (See Addendum A for a complete listing of hydropower projects.) In total the Maine hydropower facilities provide 731 MW of indigenous capacity and represent 31% of our electricity supply. Clearly, hydropower makes a valuable contribution to the total energy mix.

HYDROELECTRICITY PRODUCED/SUPPLIED BY SECTOR
Hydro Data expressed in Megawatt hours

	1987	1988	1989	1990	1991
Industrial	1,021,105	963,341	1,103,047	1,523,009	1,176,454
CMP Hydro	1,255,251	1,313,730	1,387,243	1,767,324	1,718,951
CMP PURPA	258,308	372,490	558,398	693,649	723,466
BHE Hydro	174,812	188,976	285,570	219,588	197,052
BHE PURPA	9,533	10,740	12,187	130,731	115,938
MPS Hydro	5,559	5,750	5,676	6,947	6,368
TOTALS	**2,274,568**	**2,855,027**	**3,352,121**	**4,341,248**	**3,938,228**

Maine Hydroelectric Production



Maine ranks third in the nation with 24 hydropower license expirations in 1993. These 24 hydropower projects represent 44% of our current indigenous hydropower capacity and 10% of the total electricity supply in Maine. The State of Maine is committed in the relicensing process to preserving as many inexpensive and indigenous kilowatt hours as it can within the constraints of current environmental standards. These projects are a valuable asset to Maine's energy mix and provide a substantial portion of the State's indigenous power production.

In this regard, Maine is not unique. The value of hydropower to the northeast region of the U.S. is often overlooked in energy planning. In New England and New York State combined, hydroelectric facilities provide about 7,800 MW of installed generating capacity and produce roughly 32 million MWh of energy annually (1987 DOE). These figures represent about 15% of the region's total electrical capacity and energy production supply which is vital in maintaining our region's ability to keep pace with the demand.

Those who recognize the many advantages of hydropower as an energy resource also realize that hydropower is a preferred energy supply source in New England. It is reliable, renewable and non-polluting. This last attribute is especially attractive in the current era of concern with combustion and its effects on global-warming. Hydroelectricity does not result in the deleterious impacts associated with fossil fuel combustion or nuclear generation. Indeed, according to a study prepared for NEPOOL in September 1988 entitled, "New Englander's Attitudes Toward Energy Supply Issues," New Englanders' primary concerns are with the environment and pollution. The study also finds that,

"In general hydroelectric power continues to be the source of electricity most preferred by New England residents."

In 1983, when the Maine Waterway Development and Conservation Act was passed, the Maine Legislature clearly acknowledged hydropower as a preferred energy option. By passage of this act, Maine law-makers recognized the unique value of the abundant hydropower resources of the State of Maine and clarified its policy regarding the development of hydropower. The legislature declared that hydropower justified singular treatment because of the unique benefits that it can provide. Further, it became the policy of state government to support and encourage the development of hydroelectric power as illustrated by the following quotation from MRSA 38 § 631.

> "The Legislature finds and declares that the surface waters of the State constitute a valuable indigenous and renewable energy resource; and that hydropower development utilizing these waters is unique in its benefits and impacts to the natural environment, and makes a significant contribution to the general welfare of the citizens of the State for the following reasons.
>
> A. Hydropower is the state's only economically feasible, large-scale energy

resource which does not rely on combustion of a fuel, thereby avoiding air pollution, solid waste disposal problems and hazards to human health from emissions, wastes and by-products. Hydropower can be developed at many sites with minimal environmental impacts, especially at sites with existing dams or where current type turbines can be used.

B. Like all energy generating facilities, hydropower projects can have adverse effects; in contrast with other energy resources they many also have positive environmental effects. For example, hydropower dams can control floods and augment downstream flow to improve fish and wildlife habitats, water quality and recreational opportunities.

C. Hydropower is presently the state's most significant indigenous resource that can be used to free our citizens from their extreme dependence on foreign oil for peaking power."

FACTORS WHICH AFFECT HYDROPOWER DEVELOPMENT

Just as Maine's rivers had a great impact on the State's early development, they have continued to make a significant contribution in the 20th century. In the period from 1970 through 1989, hydroelectric production in Maine grew by 115%. Indeed, since 1979, indigenous hydropower supplies have increased by 182 MW of installed capacity. Available PURPA benefits and a period of rapid growth in Maine stimulated this unprecedented increase in small privately-owned domestic energy plants during the early 1980's. In addition to hydropower, biomass and cogeneration plants were developed. The early 1980's sales contracts with the utilities for these PURPA projects stimulated their rapid development. However, low oil prices, correspondingly low avoided-cost rates and changes in the Federal Power Act have made many previously attractive hydropower ventures no longer economically feasible. As a result, interest in the development of renewable and alternative energy sources, including hydropower, has diminished.

There are many operational advantages of hydropower. The average useful life of a hydropower facility is well over 50 years. Indeed, Maine is home to several large hydro facilities which will exceed this average (and the term of their licenses) in providing reliable electricity. The non-existent fuel cost and the low operating and maintenance costs of hydropower usually offset the high initial capital costs. The amortized hydro facilities that operate in Maine are as close as we come to perpetual motion machines.

The disadvantages of hydropower are not operational but rather are environmental and regulatory. Some inevitable environmental costs associated with hydropower include depletion of dissolved oxygen in the water, curtailment of nutrient flows, interruption or possible elimination of fish migrations, disruption to down-river exchange of genetic material, separation of terrestrial habitats from one another and alteration of instream conditions for aquatic life. However, most of these potentially adverse conditions can be

mitigated or compensated for to some degree. In fact, hydropower dams often provide benefits to recreation and fisheries resources that could not be enjoyed under naturally occurring conditions. Because a dam or hydro-project exerts control over the water flow regime of a given river and because resource enhancements (facilities) are required during licensing, many projects provide conditions more conducive to desired rafting and boating activities than that provided by a river which goes dry under natural flow conditions in the summer. In addition, project flow operation often enhances the conditions necessary for fish and wildlife spawning. Most hydropower projects in Maine were licensed prior to enactment of the National Environmental Policy Act (NEPA) or the Clean Water Act. During the relicensing process adjustments to the projects will be made to bring them into compliance with current environmental standards.

In hydropower licensing the ideal situation occurs when the **priorities for the natural resources**, which might be affected by a hydro project, have been **established prior to licensing.** This organized and planned approach decreases the chance of a haphazard decision concerning the use of the river resource. That is the reason Maine continues to update The State of Maine Comprehensive Rivers Management Plan and has prepared a set of hydropower policies by the State's hydro reviewing agencies entitled, Maine State Agency Hydropower Policy Statements. The purpose of the policy statements is two-fold. The policies are intended, first, to guide the hydropower developer through the regulatory process and, second, to establish reasonable expectations of the state agencies during the licensing process.

With the exception of nuclear power, hydropower projects are subject to the most stringent set of regulatory requirements of any energy resource. The regulatory process is generally a very inhibiting factor to hydropower development. Amendments made to the Federal Power Act through the Electric Consumer Protection Act and the attendant rulemakings have served to complicate the regulatory process. While ultimately these changes had the potential to clarify the indefinite FERC administrative process, thus far they have served to make the regulatory process much more costly and much less predictable. It remains to be seen what the outcome will be for most of the existing Maine hydropower projects which are being evaluated and relicensed in the context of FERC's energy and environmental balancing act. The rate-payer's interest in low cost hydroelectricity is represented only by the applicant and the local public utilities commission in the FERC licensing process.

Apart from relicensing, hydro development over the past three to four years has slowed dramatically. The market conditions necessary to encourage hydropower development once again would involve high oil prices, attendant high fossil fuel indicies and resultant high avoided-cost rates for public utilities. They might include, as well, renewed tax incentives, extended accelerated depreciation, insurance availability for hydro-business interests at a reasonable cost and other incentives. While economics is a significant factor in the development of hydropower, the prevailing regulatory disposition is a generally more pervasive and inhibiting factor.

THE FUTURE OF HYDROPOWER DEVELOPMENT IN MAINE

Despite the already significant amount of hydropower generation in the Northeast, opportunities for increased hydropower supplies still exist. In Maine, we have one major proposed new development pending whose total generating capacity, if licensed and built, would provide a five-fold increase over the capacity of the existing (Veazie/Orono) components of the project. The proposed Basin Mills Hydroelectric Project could provide 54.4 MW while the Veazie and Orono Projects combined currently provide 10.7 MW. At this time, Basin Mills is the only new proposal being considered for development. The immediate prospects for additional hydro development in Maine are not promising.

However, if market conditions change in the future making hydropower once again an economically attractive energy option, a variety of potential hydropower sites could be developed in Maine and neighboring Canada. For purposes of revisiting these prospective options, the State Planning Office has updated information provided in the 1982 Comprehensive Hydropower Plan regarding the potential for further hydro development. Current estimates, detailed below, indicate that approximately 297 MW of additional hydropower could be developed in Maine if economic conditions conducive to development were to prevail. The future for hydro development is still promising in the context of its value as a least cost energy option. For most utilities which operate hydro projects, existing hydro is still the least cost energy option at less than one cent per kilowatt hour. Many currently dormant hydro sites may well become attractive again under the appropriate economic circumstances.

MAINE'S HYDRO DEVELOPMENT POTENTIAL

PROJECTED HYDRO DEVELOPMENT

Category of Projects		Capacity Change
I.	New Dams currently in the Licensing and Permitting Process and not on-line prior to August 1, 1991.	38.00
II.	Potential at Undeveloped Sites (Not Specifically protected under Maine Law).	158.48
III.	Incremental Capacity at Existing Generating Dams which are currently in Process of Relicensing.	57.60
IV.	Potential at Existing Dams not currently in Licensing and Permitting Process.	43.27
	TOTAL	297.35 MW

A detailed itemization of how the figures listed previously were derived follows:

I. **New Dams currently in the Licensing and Permitting Process and not on-line prior to June 30, 1992**

Project	Change in Capacity
Basin Mills	38MW

II. **Potential at Undeveloped Sites (which are not specifically protected under Maine Law and offering no judgement on the economic and environmental viability).**

Project	MW Change in Capacity
Projects in Groups I and II of Sysko Study*	28.00
Big A	40.00
Castle Hill	18.00
Half Moon Cove (tidal power site)	12.00
North Anson	3.50
Carrabassett	4.40
Gilead	3.00
Straight Bay	12.40
Pineland	.02
Andro-Dixfield	5.30
Moose River	4.00
Big Sandy-Somerset	11.50
Medomak Project	.36
Winn	16.00
TOTAL MW	158.48

*Given avoided-cost rates in the $.06 to $.08 KWH range. This data was derived from, "Feasibility Study of Maine's Small Hydro Potential", produced by SPO and OER in 1989 and co-authored by Jim Sysko. The study was conducted to assess the feasibility for development of additional hydropower at previously undeveloped sites in Maine. The study revealed a potential for 28 MW of small scale hydropower.

III. Incremental Capacity at Existing Generating Dams which are currently in Process of Relicensing

CAPACITY	EXISTING		POTENTIAL		
PROJECT	MW	MWH/YR	MW	MWH/YR	CHANGE
Bonny Eagle	10.1	43,200	11.7	47,900	1.6
Upper Rumford	23.6	146,200	28.5	156,000	4.9
Lower Rumford	13.0	101,600	22.2	128,600	9.2
Gulf Island	21.3	116,000	27.7	128,000	6.4
Deer Rips	11.0	59,800	12.3	66,000	1.5
Weston	12.0	81,000	15.6	91,000	3.6
Edwards Dam	3.5	29,700	28.0	108,000	24.5
Fort Halifax	2.0	8,600	2.7	10,500	0.7
Snow Pond	0.0	0	0.3	1,100	0.3
E. Millinocket	6.7	50,000	13.3	72,100	6.6
Stillwater	1.6	18,400	3.1	23,100	1.5
Orono	2.4	19,000	3.1	23,600	0.7
Veazie	7.0	54,500	25.2	121,400	18.2
Milford	6.9	54,800	10.1	68,000	3.2
Caribou	.8	5,580	6.9	22,200	6.1
				TOTAL	57.6

IV. Potential at Existing Dams not currently in Licensing and Permitting Process

Project	MW Capacity
Bangor Dam	25.50
Littlefield	2.00
Wilson Pond	.10
Welchville	.28
Souadabscook	.17
Stevens Brook	.20
Crocker Pond	.05
Middle Dam	10.00
East Outlet	1.14
St. George River	.10
Cumberland Mills	1.80
Ladd Dam	.10
Robbins	.12
Rocky Gorge	.40
Rangeley Lake Dam	.30
Guilford	.42
Frankfort	.55
Bunny Run	.02
Pineland	.02
TOTAL	43.27

Data for Category III. was derived from a 1989 Williams and Broome, Inc. study done for OER entitled, "Assessment of Potential for Redevelopment of 14 Hydroelectric Stations in the State of Maine due for Relicensing Before December 31, 1993."

Based on information gained from OER's draft, "Inventory of Existing and Former Dams," printed in 1987, it is estimated that an additional 70 MW of hydropower potential could be realized at existing and former dam sites located on river stretches which are not protected by the 1983 Rivers Act. If one considers this figure, the total hydro potential for Maine is approximately 367 MW of capacity.

Apart from relicensing, hydro development over the past three to four years has slowed dramatically. This is demonstrated by the fact that no new preliminary permits have been issued since 1986 and there are no preliminary permits currently outstanding. Exemptions for two high-head, micro-hydro projects were issued in 1989 (Bunny Run and Pineland) but there are no exemption applications currently pending.

A total of seven projects involving 24 MW of new capacity came on-line during 1988. These projects include: Kennebago, Great Works, Benton Falls, West Enfield, Aziscohos, Lockwood and Seabright. A 1.8 MW expansion at the Madison Electric Co. Abenaki plant went on line in 1990 and a 3 MW change in capacity at Madison's Anson plant has been approved and went on line in 1991.

An additional six projects totaling 52 MW of new capacity have been under construction and most of them went on-line during 1989-1990 including: Worombo, Lewiston Falls, Hydro-Kennebec, Brassua, Ledgemere and Biscoe Falls. With the exception of Basin Mills no significant increases in new hydropower capacity are currently proposed. While the total generating capacity of the proposed Basin Mills Hydroelectric Project, is 54.4 MW, the net increase in capacity that Basin Mills would provide is 38 MW.

Maine exhausted most of its inventory of attractive sites during the boom years of PURPA in the mid-1980's when oil prices were high, avoided cost rates were correspondingly high and tax incentives were generous. Changes in the Federal Power Act, costly insurance coverage requirements, high avoided cost rates and oil prices and the lack of economic incentives conspired to make hydropower unattractive for developers during the close of the 1980's.

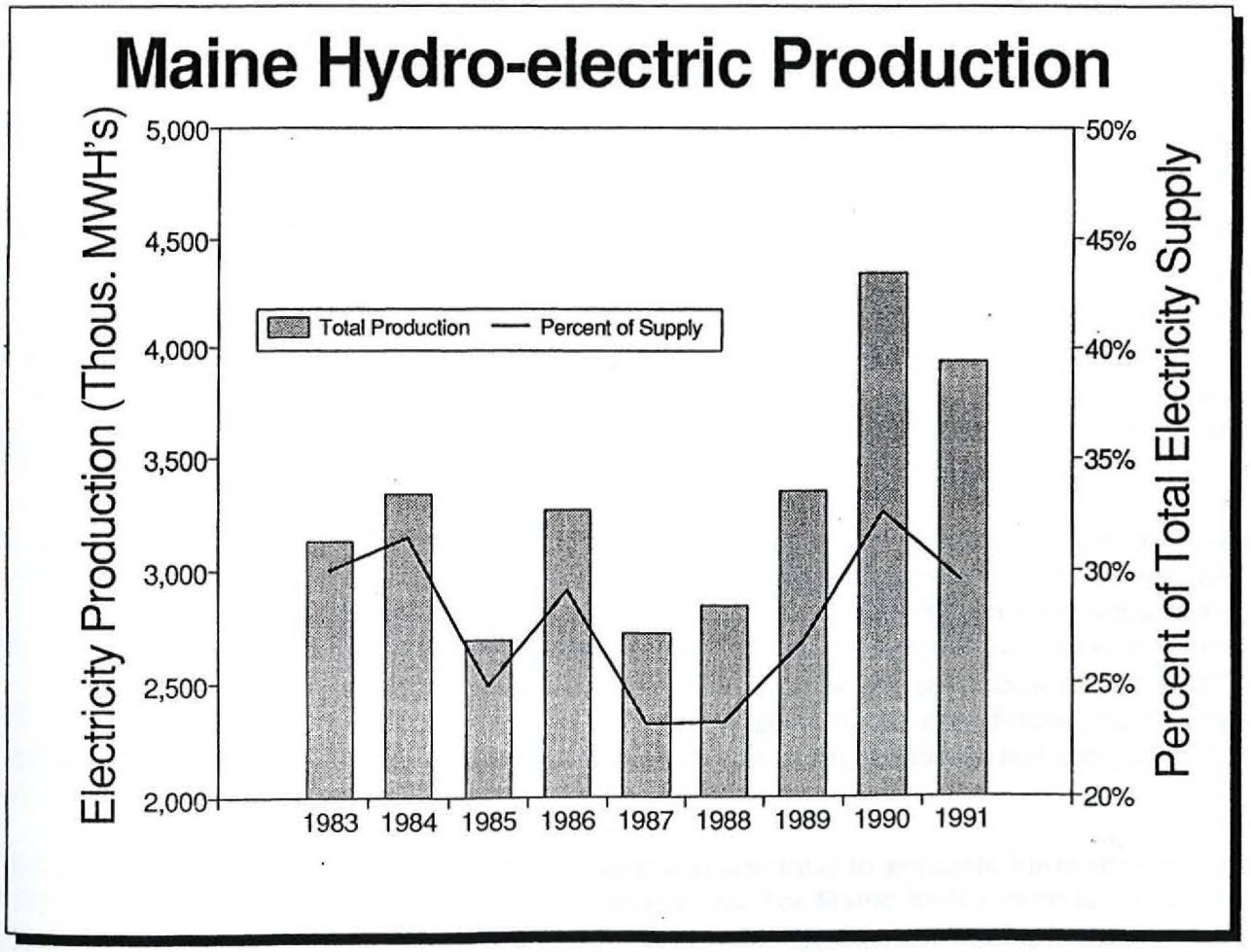
However, the notorious unreliability of oil-producers and the recent concerns for an earth-warming trend have made non-combustion energy alternatives, such as hydropower, appear valuable again. The U.S. Senate Energy and Natural Resources Committee has endorsed a global warming bill calling for a study of the factors inhibiting expansion of capacity at existing dams. The bill promotes energy efficiency and renewable energy to reduce greenhouse gases. The U.S. Department of Energy study quantifies the contribution that hydro could make to energy needs and greenhouse gas reduction.

New hydropower development, which can directly displace fossil-fuel generated electricity, could contribute in small degree to the solution of the global warming problem. Although it is likely that new hydropower development in Maine would provide only modest relief from the global warming problem, development of hydropower should continue to be encouraged in a manner consistent with the Maine Rivers Act and which requires a balance between the fisheries, recreational and hydropower values in the permitting of the remaining sites.

In the early 1970's hydropower supplied approximately 35% of the electrical energy used in the State. Subsequently, Maine's hydropower production, as a percentage of Maine's total electrical production,

diminished due to the increase in consumer electrical demand. In 1986, hydropower supplied only 23% of the electricity consumed in the state. Maine's utilities received approximately 19% of their electricity supplies from hydropower in 1986. The realization of several large hydro projects and development of many PURPA projects has allowed hydro to achieve its present level of contribution to the total electric supply. In 1990, which was an exceptional hydro production year due to abundant and steady water supply and increased capacity on-line (Worombo, Lewiston Falls, West Enfield and Hydro-Kennebec), hydro provided 33% of the total electrical supply in Maine. Hydro continues to be Maine's largest single source of energy providing more electricity than nuclear or oil.

Despite the factors working against hydro expansion, the volume of hydroelectric production has held steady over the last five years. During its high point of growth, due to PURPA and the attendant high avoided cost rates, in 1983 and 1984 respectively, indigenous Maine hydropower supplied 3,251,263 MWH and 3,573,284 MWH of electricity. In 1987 Maine production decreased dramatically to 2,274,568 MWH but we have seen a steady increase in levels since then as illustrated by the following chart.



While the Northeast is currently enjoying an abundance in energy supplies, Central Maine Power Company (CMP) projects that 100-700 megawatts of capacity from new energy resources will be required by the year 2008 due to load growth and retirement of aging facilities, such as Maine Yankee and Wyman Station. Bangor Hydroelectric Company (BHE) projects a need for more electricity in the coming decades as well. The proposed Basin Mills hydropower project is BHE's solution to the anticipated need for capacity in the future. BHE treats hydro as a supply resource that can be used to counter-balance long-term future electricity demand. While new hydro is almost always a good investment in the future, it is unlikely that we will see hydro development burgeoning in the nineties the way it did in the early 1980's.

Despite the perception that an expanded base of energy supply will be required in the future, the utilities have a difficult time justifying high capital cost expenditures, like hydro, in this time of abundant energy supply. Other least cost alternatives such as conservation and more efficient energy management are attractive to the utilities and the PUC, especially in the context of the Northeast's downturn in economic growth. We witnessed the preference for least-cost alternatives, such as these, in the case involving CMP's proposal to import hydroelectricity from Hydro-Quebec which was ultimately rejected by the PUC in 1989.

The proposed purchase of up to 900 megawatts of power from Hydro Quebec over the period 1992-2020 forced the State of Maine to analyze complex and important issues regarding its energy future. The Hydro-Quebec purchase would have provided Maine with a fairly reliable energy supply at a predictable price for nearly 30 years. In the end the PUC rejected the Hydro-Quebec proposal based on the rationale that it was not the least cost alternative. The environmental impacts of the proposed power line and doubts over the local need for the power, by those who would be adversely affected by the power-line, were also factors in the PUC decision process.

As a result of the Hydro-Quebec decision CMP instituted a requirement that only qualifying facilities be granted contracts. Unfortunately, a backlash, resulting in less indigenous hydro development, was created by CMP's qualifying facility condition. Several opportunities for development of economic small scale hydro and biomass projects were foregone due to this CMP requisite in response to the PUC decision on Hydro-Quebec.

In the foreseeable future, self-generation is a potential medium by which hydro development could increase in Maine. Real demand for new hydro supply in Maine may be generated by business and industry which requires on-site energy. In circumstances where avoided cost rates are not a factor, hydro can, as it always has, provide an inflation free source of power in situations which require a source of inexpensive energy. Promotion of Maine as a prime location for small business to settle and develop their own hydroelectricity could allow hydro to grow again in the near future. Maine's hydro energy resources are a distinguishing feature and could serve to attract business and industry with a penchant for self-generation.

Meanwhile, the existing hydroelectric facilities in Maine will continue to generate kilowatts in a volume comparable to that of Maine Yankee, but with two exceptions. For Maine hydro there is no end in sight to the life of the facilities and there are no waste issues to negotiate. In addition, the non-existent fuel cost and low operating and maintenance costs of our indigenous hydropower projects have long ago offset the initial capital costs. While Maine is part of a region which is well endowed with hydropower resources it is also very energy intensive and oil dependent. Maine's amortized hydro

facilities provide Maine a degree of freedom from dependence on oil. For these reasons and many others, the management of Maine's rivers has been and will continue to be critical to its economic future and environmental well-being.

Addendum A

Complete List of FERC Approved Hydropower Projects in Maine

FERC #	Project Name	Capacity (MW)	Location	Misc.
2142	Harris	76.6	T1 R6	CMP
2194	Bar Mills	4.	Hollis	CMP
2283	Gulf Is./Deer Rips	29.34	Lewiston/Auburn	CMP
2284	Brunswick	19.	Brunswick/Topsham	CMP
2302	Lewiston Falls	33.07	Lewiston/Auburn	CMP
2312	Great Works	7.73	Old Town	JR
2322	Shawmut	8.65	Fairfield	CMP
2325	Weston	12.	Skowhegan	CMP
2329	Wyman	72.	Moscow/P.Ridge Plt.	CMP
2333	Rumford	39.35	Rumford/Mexico	RFP
2335	Williams	14.5	Embden/Solon	CMP
2364	Abenaki	16.97	Madison	MPI
2365	Anson	9.	Madison	MPI
2366	Millinocket Lake	storage	T7 R9	MPS
2367	Caribou	.8	Caribou	MPS
2368	Squa Pan	1.5	Masardis	MPS
2375	Jay/Riley/Livermore	19.54	Jay/Riley/Liverore	IP
2389	Edwards	3.5	Augusta	EMC
2403	Veazie	8.4	Veazie/Eddington	BHE
2458	Penobscot Mills	55.3	Milliocket et.al.	GNN
2492	Vanceboro	storage	Vanceboro	GPC
2519	North Gorham	2.25	Gorham/Windham	CMP
2520	Mattaceunk	19.2	Mattawamkeag/Woodvl	GNN
2527	Skelton	16.8	Dayton/Buxton	CMP
2528	Cataract	7.55	Biddeford/Saco	CMP
2529	Bonny Eagle	7.2	Hollis/Standish	CMP
2530	Hiram	10.9	Hiram/Baldwin	CMP
2531	West Buxton	8.12	Buxton/Hollis	CMP
2534	Milford	6.4	Milford/Old Town	BHE
2552	Fort Halifax	1.5	Winslow	CMP
2555	Automatic (M4)	.8	Waterville	CMP
2556	Union Gas (M5)	1.5	Waterville	CMP
2557	Rice Rips (M3)	1.6	Oakland	CMP
2559	Oakland (M2)	2.8	Oakland	CMP
2572	Ripogenus	37.53	T3 R11	GNN
2574	Lockwood	6.55	Waterville/Winslow	MLP
2600	West Enfield	13.	Enfield/Howland	BHE
2611	Hydro-Kennebec	17.5	Winslow/Waterville	UAH
2612	Flagstaff	storage	T3 R4	CMP
2613	Moxie	storage	East Moxie Twp	CMP
2615	Brassua	4.18	Rockwood Twp	BHL
2618	West Branch	storage	West Grand Lake	GP
2634	Great Northern	storage	Seboomook et.al.	GNN
2660	Forest City	storage	Forest City	GP
2666	Medway	3.44	Medway	BHE
2671	Moosehead Lake	storage	Big Squaw/Taunton	KWP
2710	Orono	2.33	Orono	BHE
2712	Stillwater	1.95	Old Town	BHE
2721	Howland	1.875	Howland	BHE

FERC #	Project Name	Capacity (MW)	Location	Misc.
2727	Ellsworth	8.9	Union	BHE
2804	Goose	.369	Belfast	GRH
2808	Barkers Mill Lower	1.5	Auburn	CHM
2809	American Tissue	.9	Gardiner	CHM
2897	Saccarappa	1.35	Westbrook	SDW
2931	Gambo	1.9	Gorham/Windham	SDW
2932	Mallison Falls	.8	Gorham/Windham	SDW
2941	Little Falls	1.	Gorham/Windham	SDW
2942	Dundee	2.4	Gorham/Windham	SDW
2984	Eel Weir	1.8	Standish/Windham	SDW
3133	Errol	2.01	Magalloway/Upton	UWP
3428	Worumbo	19.1	Lisbon/Durham	MHG
3444	Rocky Gorge	.5	South Berwick	EXMPT
3562	Barkers Mills Upper	.95	Auburn	CHM
3777*	Rollinsford	1.49	South Berwick	ROL
3820*	Somersworth	1.50	Berwick	GE
3984*	South Milton	1.	Lebanon	EXMPT
3985*	North Rochester	.250	Berwick	EXMPT
4026	Aziscohos	5.2	Magalloway	AHC
4202	Pumpkin Hill	.950	Lowell	CHM
4293	Waverly Avenue	.700	Pittsfield	EXMPT
4413	Kennebago	.900	Stetsontown Plt.	EXMPT
4451*	Lower Great Falls	1.289	Berwick	SHC
4542*	Boston Felt	.150	South Lebanon	EXMPT
4727	Grist Mill	.200	Hampden	EXMPT
4784	Pejepscot	13.88	Topsham/Brunswick	THP
5073	Benton Falls	4.28	Benton	BFH
5362	Lower Mousam	.600	Kennebunk	KLP
5399	New Mills	.116	Gardiner	EXMPT
5613	Brown's Mill	.550	Dover-foxcroft	EXMPT
5647	Milo	.600	Milo	EXMPT
5912	Dover Upper Dam	.300	Dover-Foxcroft	EXMPT
6132	West Winterport	.150	West Winterport	EXMPT
6398	Hackett Mills	.485	Minot	HMHA
6588*	Milton Three-Ponds	.180	Lebanon	J.Rea
6618	Frankfort	.550	Frankfort	EXMPT
6684	Days Mill	.060	Arundel	EXMPT
7118	Smelt Hill	1.125	Falmouth	EXMPT
7189	Green Lake	.500	Ellsworth	GLWPC
7253	Sebec	.490	Sebec	EXMPT
7473	Gilman Stream	.098	North New Portland	EXMPT
7591	Wight Brook	.030	Newry	EXMPT
7979	Foss Mill	.015	Brooks	EXMPT
8277	Otis	10.00	Chisholm	OHC
8321	Thurston Mill	.338	Mexico	EXMPT
8417	Sparhawk	.270	Yarmouth	EXMPT
8450	Stoney Brook	.035	Newry	EXMPT
8505	Abbots Mills	.040	Rumford	EXMPT
8640	Seabright	.094	Camden	EXMPT
8736	Pioneer	.300	Pittsfield	EXMPT

FERC #	Project Name	Capacity (MW)	Location	Misc.
8788	Ledgemere	.400	Limerick/Waterboro	EXMPT
8791	Starks	.050	Starks	EXMPT
9079	Upper Spears	.050	Peru	EXMPT
9340	Kezar Falls (Lower)	.650	Porter/Parsonfield	Smith
9384	White's Brook	.060	Riley/Gilead	EXMPT
9411	Biscoe Falls	.050	West Paris	EXMPT
9421	Gardiner Brook	.060	Andover	EXMPT
11006	Upper Androscoggin	.995	Lewiston	Lwstn
TOTALS	107 Projects	700.734 MW		

Several projects are identified here with an asterisk * following the FERC project number. These projects, while utilizing dams and or impoundments located within the State of Maine's boundaries on the Salmon Falls River and the Androscoggin River, are actually generating power in New Hampshire.

All approved projects on this list have been constructed and are on-line with the exception of FERC #9340 - Kezar Falls, whose installation of a 150 kw minimum flow turbine is complete and is expected to be on-line by the end of July 1992. Exemptions have been revoked for the following projects; FERC #9102 - Holmes Mill, FERC #8969 - Crocker Pond, and FERC #10167 - Stoneybrook.

Projects identified in the miscellaneous column as EXMPT have **exemptions** from the licensing provisions of the Federal Power Act. Exemptions are issued in perpetuity for the development of non-Federal waterpower projects having a capacity of 5 MW or less and which utilize an existing dam or natural water feature. The licensed projects have in the miscellaneous column an abbreviation of the company name or personal name of the Licensee. Licenses are issued for thirty, forty or fifty years under the Federal Power Act for the development or continued operation of non-Federal waterpower projects. FERC's jurisdiction extends to all projects on navigable waters and to projects on non-navigable waters constructed or modified after 1935. A project on a non-navigable waterway must affect interstate or foreign commerce in order to trigger federal jurisdiction. Such affect is assumed when project power is conveyed to the public utility power grid.

In addition to FERC approved hydropower projects, there are a number of projects in Maine which have enjoyed operation without licensing and contribute significantly to the hydropower supply. Some are "grandfathered," projects, which are not subject to FERC licensing. Some of these "grandfathered," projects, have recently been found to be jurisdictional and others of these generating dams are under review at FERC to determine if they are eligible for licensing. The projects in these three unlicensed categories are listed on the following page and add up to approximately 30 MW of installed capacity.

Generating Projects Found by FERC to be **NON-JURISDICTIONAL**

Project	Installed Capacity	FERC Order Date	River/Location
Grand Falls	9.5 MW	10-28-88	St.Croix/Washington Co.
Woodland	8.6 MW	10-28-88	St. Croix/Washington Co.
Great Works	500 KW	06-27-89	Great Works Riv./York Co.
Wilson Stream	740 KW	06-09-89	Wilson Strm-Pond/York Co.

Generating Projects Found by FERC to be **JURISDICITONAL**
(most of which are currently in the licensing process)

Project	Installed Capacity	FERC Order Date	River/Location
Eustis	190 KW	09-24-87	Dead River/Franklin Co.
Estes Lake	300 KW	08-01-88	Mousam River/York Co.
South Berwick	1.2 MW	09-30-88	Salmon Falls /York Co.
Old Falls	600 KW	04-21-89	Mousam River R./York Co.
Damariscotta Mills	500 KW	09-21-89	Damariscotta R./Lincoln
Swan's Falls	640 KW	09-13-89	Saco River/Oxford County
Sandy River	450 KW	09-22-89	Sandy River/Somerset Co.
Marcal/Mechanic Fls	2.1 MW	02-07-91	Androscoggin R./Andro Co.
Burnham	1.05MW	02-07-91	Sebasticook R./Waldo & Somerset Counties

Generating Projects **UNDER REVEIW AND PENDING** a FERC Decision

Project	Installed Capacity	River/Location
Milltown	3.9 MW	St. Croix River/Washington Co.
Penneseewasee Stream	300 KW	Penneseewasee Strm./Oxford Co.

All of the generating projects found to be jurisdictional are owned by Consolidated Hydro Inc. (CHI) except the Sandy River Project which is owned by the Madison electric Company, a municipal utility. All of these projects were found to be jurisdicitonal due to navigability. There are a few unlisted generating dams in Maine which generate minimal mechanical and or electric energy on site and do not require licensing.

Addendum B

STATE OF MAINE
Status of Relicensing at FERC
June 1992

Project	FERC No.	Applicant	Installed Cap. MW	Filing Date	Info. Requested	Notice Issued	Comment Deadline	License Issued
Androscoggin River Basin								
Gulf Island/Deer Rips	2283	CMP	29.34	12/10/91	5/26/92			
Rumford Falls	2333	RFP	34.77	12/30/91	5/20/92			
Aroostook River Basin								
Squa Pan	2368	MPS	1.50	12/28/88	3/13/88	8/8/89	10/12/89	12/04/91
Millinocket Lake	2366	MPS	storage	6/27/91	8/26/91			
Caribou	2367	MPS	.800	6/27/91	8/26/91			
Kennebec River Basin								
Edwards	2389	ADC	3.50	12/30/91				
Union Gas	2556	CMP	1.50	12/4/91				
Fort Halifax	2552	CMP	1.50	11/25/91	4/20/92	6/10/92		
Automatic	2555	CMP	.800	12/4/91	5/19/92			
Rice Rips	2557	CMP	1.60	12/4/91	5/19/92			
Oakland	2559	CMP	2.80	12/4/91	5/19/92			
Weston	2325	CMP	12.00	11/20/91	4/24/92			
Wyman	2329	CMP	72.00	12/10/91	5/14/92			
Moosehead Lake (East Outlet)	2671	KWP	storage	12/24/91	6/8/92	6/12/92		
Moxie	2613	CMP	storage	12/24/91	5/14/92			
Penobscot River Basin								
Veazie (Basin Mills)	2403	BHE	8.40	7/31/90	12/5/90			
Orono (Basin Mills)	2710	BHE	2.30	7/31/90	12/5/90			
Stillwater	2712	BHE	1.95	12/30/91		5/13/92		
Milford	2534	BHE	6.40	12/29/91	3/15/89			
Penobscot Mills	2458	GNP	40.55	12/17/91	6/8/92	6/16/92		
Ripogenus	2572	GNP	37.53	12/17/91	6/8/92	6/16/92		
Presumpscot River Basin								
North Gorham	2519	CMP	2.25	11/13/91	3/30/92			
Saco River Basin								
Skelton	2527	CMP	16.80	12/17/91	5/14/92			
Bonny Eagle	2529	CMP	7.20	12/18/91	5/29/92			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